The Tasmanian records of the Swamp Helmet-orchid *Corybas fordhamii* (Rupp) Rupp

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Abstract
The Swamp Helmet-orchid *Corybas fordhamii* (Rupp) Rupp was collected in a southern gully of the Darling Range on Flinders Island in September 1972 when about 45 plants were noted. The species had not been recorded in Tasmania previously. It was found again in early May 2005 when just two leaves were noticed, although 142 plants were found when the site was visited in late August and early September of the same year. The gully was visited five times in September 2009 when 102 orchids were found. Most plants were upstream or downstream of the localities of 2005. The vegetation of the all sites is described below but the exact locality is not given as the orchid is scheduled as endangered under the Tasmanian *Threatened Species Protection Act 1995*. The records, and two potential threats, are discussed. (*The Victorian Naturalist* **128**(1) 2011, 18-22).

Keywords: Flinders Island, Swamp Helmet-orchid, *Corybas fordhamii,* endangered Tasmanian plant.

The discovery in 1972

In July 1972, Maureen Christie and the author collected several plant specimens, including the Veined Sun-orchid *Thelymitra cyanea*, in a southern gully of the Darling Range on Flinders Island. No field notes were taken and the only written record of the ramble is the plant-press slips for the specimens. Two include rough sketch maps showing the gully. The author revisited the site two months later, probably because puzzling orchid leaves had been noticed in the unusual, very wet habitat.

The site's main cover in September 1972 was Scented Paperbark *Melaleuca squarrosa* from 60 cm to 1.5 m high. There were also occasional Dagger Needlewood *Hakea teretifolia* to 1.8 m and Manuka *Leptospermum scoparium* of 1.2 to 1.8 m. These three shrubs gave about 60% cover. The shorter shrubs were the Blunt-leaved Heath *Epacris obtusifolia*, Pink Swamp-heath *Sprengelia incarnata* and a Guinea-flower *Hibbertia* sp. The notes do not mention how common they were. Three of the herbs were on very damp ground. They were the Forked Sundew *Drosera binata,* a Greenhood orchid (probably *Pterosylis uliginosa*) and, in 'deeper parts', the Square Twig-rush *Baumea tetragona.* The 11 other herbs included the Short Purple-flag *Patersonia fragilis*, Slender Twine-rush *Leptocarpus tenax,* Tall Yellow-eye *Xyris operculata* and Large Tongue-orchid *Cryptostylis subulata.* Some '40 or 50 plants' of a novel Helmet-orchid were found and the species was identified, using Nicholls (1969), as the Swamp Helmet-orchid *Corybas fordhamii* (Rupp) Rupp. This orchid had not been recorded previously in Tasmania and the seven collected plants are the first Tasmanian specimen. The notes give no indication of the size of the site nor how far it was from either bank.

Specimen: 14.ix.1972. The sopping bed of a seasonal stream of the slope at the southern end of the Darling Range, Flinders Island. John Whinray C2 052, Australian National Herbarium, CANB 332393.

The records of 2005

Much of the southern side of the range was searched in 2005 and two plants of the Swamp Helmet-orchid were chanced on at the western edge of the main eastern runnel on 2 May. The reason for a search of five days was that the sketch maps were not precise and the dominant vegetation did not match the details recorded in 1972. They indicated shrubs of a similar age, giving the impression that they had grown after a bushfire. However, the gully's old Scented Paperbarks had all tillered after a fire in January 2003 and were markedly taller than the seedling Manukas and Scented Paperbarks of 1972. While there were dead Dagger Needlewoods along the main eastern runnel, no seedlings were noticed. It is difficult to understand why a fire, fierce enough to kill the paperbarks com-

pletely, would not have seriously damaged the mounds carrying orchids.

The gully was examined carefully on 20 August 2005. While the original site was not located, Swamp Helmet-orchids were found where the bed — about 20 m wide — consisted of low mounds, most of which carried at least one Scented Paperbark. The main eastern runnel divides into five or more after heavy rain. While thousands of short seedlings of the paperbark were present, the dominant layer — up to 2 m high — was formed by tillers of the older shrubs which were about 6.6 m high when burnt in January 2003. All the Swamp Helmet-orchids were found on mounds crowned by Scented Paperbarks. One mound, which rose about 20 cm above the sopping soil, carried Spreading Rope-rush *Empodisma minus,* Hairy Rice-grass *Tetrarrhena distichophylla,* Pink Swamp-heath *Sprengelia incarnata,* Umbrella Fern *Gleichenia microphylla* and seedling Manuka. Tall Cutting-rush *Lepidosperma elatius* was also listed but, as there was no trace of it in 2009, the record must be based on the mis-determination of an immature sedge or lily. The Helmet-orchids rose from a mat of delicate liverworts, mainly a *Riccardia* sp. The only extra associated plant of the other mounds was the Large Tongue-orchid. Seventy-four Swamp Helmet-orchids were listed during this search, and the highest number recorded for one mound was ten. The second Tasmanian specimen was collected.

The third specimen was obtained from another mound on 3 September 2005 where the tillering shoots of the Scented Paperbark had reached 1.2 m high. The collection was taken 10–15 cm above water-level. Hairy Rice-grass was the main low cover. Also present were Spreading Rope-rush, Slender Twine-rush, Swamp Selaginella *Selaginella uliginosa,* Wiry Bauera *Bauera rubioides,* Swamp Boronia *Boronia parviflora,* Square Twig-rush and the matting liverworts. The only extra herb noticed with the orchids during this visit was the Ivy-leaved Violet *Viola hederacea.* Sixty-eight more Swamp Helmet-orchids were listed, bringing the total to 142. The highest number found on one mound during this visit was 34 plants. So two mounds carried 44 plants, just under a third of the total. The two patches of plants occupied about 30% of a rectangle that was estimated at about 19 m by 16 m. The main occurrence was along the eastern runnels. The minor one extended to the west from beside its southern part, occupying the edge of the dense Scented Paperbark where it gave way to the more open, sedgy ground. The area was checked to the base of the western bank. The Scented Paperbark was more dense in one part near the bank, and the crowns of the mounds were burnt shallowly by the fire of January 2003, probably because they were drier than the eastern ones. The lower cover of the burnt ground was predominantly, and often only, the foliose liverwort *Marchantia berteroana.*

Specimens: 20.viii.2005, Flinders Island. Near the locality of the specimen of 14.ix.1972. John Whinray 12551, National Herbarium of Victoria MEL 2331214.
3.ix.2005, Flinders Island. Near the locality of the prior specimen. John Whinray 12567, CANB 784197.

The searches in 2009

The gully was visited five times between 10 and 20 September 2009. The four sites recorded by GPS in 2005 were located eventually but there was no trace of any of the orchids listed at or near them. Only 17 Swamp Helmet-orchids were found in the two adjoining sites where 142 plants were listed in 2005. The dominant vegetation of the eastern runnels at the time of the fire of January 2003 was Dagger Needlewood and Scented Paperbark. While many of the latter had tillered, reaching up to 3.6 m, no sapling Needlewoods were noticed. The runnels ran up to 30 cm higher during the recent heavy rains and their banks were largely clear of fallen paperbark leaves. Further to the west, where paperbarks were the sole dominant, their leaves formed layers to several centimetres thick, suppressing most — and often all — of the small herbs. Spreading Rope-rush (to 2.4 m) was their main understorey species and Square Twig-rush (to 1.65 m) the minor one.

A site where a minor runnel left the western side of the main eastern one had a main cover of Dagger Needlewood (to about 3.6 m high) in January 2003. There were three Helmet-orchids on this mound. Its vegetation varied but the crown, with one of the orchids, carried Scented Paperbark seedlings to 30 cm high (c.

5% cover). The main lower cover was Spreading Rope-rush (c. 30% cover) browsed short by wombats. There were also small amounts of Swamp Selaginella and an immature sedge. The two Large Tongue-orchids had tiny leaves and there was one Angled Lobelia *Lobelia anceps*. The Salt Pratia *Pratia irrigua* was the only extra herb found with the other plants of this area.

Thirty-three of the current plants were found along the eastern runnels to about 30 m north from the northern end of the main occurrence of 2005. All the mounds in an open area had been browsed heavily by wombats and many showed evidence of flowing water around them. One large mound was 2 m east of the edge of the Scented Paperbarks. It had water running on one side and trickling past the other. The Scented Paperbark seedlings were from 10 to 20 cm high (c. 20% cover), but its main cover was Spreading Rope-rush (c. 60% cover) nibbled short. Slender Bog-rush *Schoenus lepidosperma* occurred throughout. There were also very minor amounts of the ground lichen *Cladia aggregata,* Hairy Rice-grass, Tall Tongue-orchid, Swamp Selaginella, a Yellow-eye *Xyris* sp., Creeping Raspwort *Gonocarpus micranthus* and Tiny Sundew *Drosera pygmaea.* The three Helmet-orchids were in the more open parts of the mound and one of them was flowering. Its large leaf was 16 mm long and the flower stood 14 mm high.

Only seven Swamp Helmet-orchids persisted at the southern site of 2005. Four plants, with leaves from 6 to 12 mm long, were on the browsed slope of a Scented Paperbark mound. The paperbark seedlings were to 30 cm (c. 5% cover), and there was one Manuka seedling. Spreading Rope-rush formed about 20% cover. The balance of the short, open cover was Swamp Boronia, Wiry Bauera, Pink Swamp-heath, Swamp Selaginella, Yellow-eye, Hairy Rice-grass and barren fronds of the Screw Fern *Lindsaea linearis.*

Five scattered occurrences, totalling 31 plants, were found for about 80 m downstream of the 2005 sites. They were usually where the Scented Paperbarks and Dagger Needlewoods were sparse before the fire of January 2003. There was no trace of the orchid where the paperbarks grew densely on slightly higher ground. The latter carried a thick layer of fallen paperbark leaves except where wombats had scratched the surface down as much as 30 cm. The major site was in a gap in the locally dominant Scented Paperbarks. There were 16 Helmet-orchids in an area of 40 cm x 15 cm on a mound. Cropped seedling Manuka, Scented Paperbark and Pink Swamp-heath gave just 5% cover. Also present were Spreading Rope-rush, Hairy Rice-grass, Swamp Selaginella, Square Twig-rush and three species of liverworts. Austral Leek-orchid *Prasophyllum australe,* Forked Sundew *Drosera binata,* and Blunt-leaved Heath *Epacris obtusifolia* were seen in this area for the first time.

The eastern runnels carry water from the slope to their north. While the chart shows the main gully as running through the area dealt with above (Tasmap 1998), only about a tenth of the upstream flow actually reaches it. It seems mostly to seep and trickle down the slope to the south. A runnel appears under paperbarks about 60 m north north west of the main orchid area, flowing from yabby holes. Twelve of the 21 Swamp Helmet-orchids of this isolated area were noticed at the edges of the runnel's first 8 m, cleared of fallen paperbark leaves by the recent rains. The species peters on one of the heavily browsed mounds of open ground just south of the paperbarks. The mound rose about 30 cm above the water flowing along its western and southern sides. The Slender Twine-rush (c. 15% cover) and Spreading Rope-rush (c. 70% cover) were nibbled short. Swamp Selaginella (c. 15% cover) and Hairy Rice-grass formed their understorey above the five Helmet-orchids. There was no main runnel for about 30 m downstream from this site and reaching that far south required some crawling. In this section runnels flowed from yabby holes, divided, disappeared briefly into others, re-emerged, and, in parts, no surface water ran. All the runnels have low banks that probably become too dry as none carried any orchids.

Further possible habitat on Flinders Island

Two very wet Scented Paperbark gullies can be seen further north from high in the Darling Range. One drains the north-eastern slopes of Mount Counsel; the other rises on the south-western side of Mount Leventhorpe. The total length of their sections, which flow in at least three runnels after heavy rain, is about a kilometre. It would be a major task for one person

to examine them thoroughly, criss-crossing from side to side. The most practicable way would be to have a party form a line across the bed and then work slowly upstream. As the smallest Swamp Helmet-orchid leaves in 2009 were just 3 and 4 mm long, and the largest 16 mm, the task would be painstaking. To judge by the inspections of September 2009, such a survey would be best done during the first two or three seasons after a bushfire. Surveys after that would be likely to find plants only on naturally bare soil, especially beside the runnels, or in spots where browsing wombats have kept the sedges, and any seedling shrubs, short. Under Scented Paperbarks, their leaves would form a layer too thick for any orchids to rise through. Plants were noticed in 2009 only on sites that lacked anything more than a very sparse layer of fallen paperbark leaves.

Two threats to the orchid gully

The only weeds in 2009 were very small plants of the exotic Flat-weed or Bear's-ear *Hypochoeris radicata* and all the noticed ones were removed. Their seeds probably blew from the pasture to the west and south-west. Annual inspections should be made to forestall the dense concentrations of Spear Thistle *Cirsium vulgare* which can be found in the bush many kilometres from the pasture on Flinders Island. Generally the Helmet-orchids occurred on wet to sopping sites close to water. Where there was no surface water, standing in the hollows between the mounds in 2005 brought some to the surface. Had the very wet, peaty soil dried out by the time of the fire of January 2003, it would have burnt fully, killing the Scented Paperbarks and all of the orchids. The main threat to the site is a narrow gully eroding slowly upstream. It has cut down about 2 m and has nearly reached the start of the broad part of the bed that carries most of the Helmet-orchids. It may be practicable to stop it from working further up the gully, lowering the water table and making the bed too dry for the Helmet-orchids.

Discussion

The site of 1972 was not identified with certainty. However, given the rough sketch maps of earlier that year, the shrubs present in 2009, and especially the occurrence then of the Swamp Greenhood, it seems likely that the original site was in the more open part of the bed not far south of the dense Swamp Paperbark area worked in 2005.

In 2009, just over six and a half years since the last bushfire, the Swamp Helmet-orchids were confined to naturally clear areas at the edges of runnels and to spots where the sedges and any seedling shrubs were being kept short by wombats. Jeanes and Backhouse (2006) noted that in Victoria helmet-orchids grow ' ...under dense thickets of Scented Paperbark (*Melaleuca squarrosa*) in and around swamps and watercourses, usually on low hummocks just above the water.' They add that the orchid is 'Usually seen only when the dense shrubby vegetation has been burnt ...' Bishop (2000: 166) noted that 'Vegetation is often very thick where the species grows and it can remain unnoticed for many years until a summer bushfire reveals it ...' It seems likely that some Tasmanian plants could remain visible until the next bushfire although, if the 2009 season is typical, only a tiny proportion of them may flower.

The difficulty of working the paperbark area in 2009 made it hard to find the various spots recorded by GPS in 2005. In parts the scrub was impenetrable because of dense fallen older Swamp Paperbark boles and the thick regrowth through them. In others it was impossible to stand and attempt GPS readings. As well the level of accuracy of the GPS readings added to the difficulty of finding previously-recorded points. It could be useful—in such vegetation—to mark a couple of GPS sites soon after a bushfire by using heavily-galvanised star steel droppers. These would last for up to 20 years.

The 142 plants of 2005 contrast strongly with the 17 found at those adjacent sites in 2009 although another 33 plants were found upstream, and 31 downstream, of the sites of 2005. There was also a contrast in the numbers showing buds, flowers, closed flowers or eaten ones. Just four formed on the 102 plants of 2009 while 33 were listed in 2005. Nine buds were recorded in late August of the latter year but none of the plants of early September still had buds.

When the 85 orchids recorded at novel sites in 2009 are added to those found in 2005, the total reaches 227 plants. Given the marked drop in

the numbers at the sites of 2005, the finds both upstream and downstream are likely to be lower than in the several years after the fire of 2003. The Helmet-orchids occurred, with breaks, in some 170 m of the gully. In the 38 years since the discovery, the orchid has not yet been found elsewhere in Tasmania. It is scheduled under the Tasmanian *Threatened Species Protection Act 1995* as endangered. This would remain the appropriate assessment even if the orchid were found to occur in the other two gullies of the Darling Range mentioned above.

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Christiania (Chriss) McInnes
5 January 1910 – 7 September 2010

Chriss McInnes (1910-2010) was an FNCV member for more than 50 years and the wholehearted supporter of her husband Daniel Ernest McInnes (1906-1998), a longstanding FNCV stalwart. Dan made an invaluable and major contribution to the club, including filling the administrative roles of President, Treasurer, and Nature Show Co-ordinator. He was also involved in the construction of the FNCV microscope, a project for which he was awarded Honorary Membership of FNCV as early as 1964 (McInnes, 1998; Houghton, 1999). There is no doubt that Chriss was the major supporter of Dan in all these FNCV endeavours, as 'his closest friend and companion of more than 66 years'. This became absolutely necessary especially when their longstanding home in a delicatessen shop at 129 Waverley Road, East Malvern was transformed, following Dan's retirement, into a major storage facility for FNCV files, especially back issues of *The Victorian Naturalist*.

Chriss and Dan were married in December 1932 and opened the East Malvern delicatessen in January 1933. They established a life for themselves there, raising four boys and running a successful store.

Dan joined FNCV when the Microscopical Society amalgamated with the Club in 1954. In June 1959 Chriss joined as a member in her own right, at a time when her four children had become substantively independent. Chriss later explained her timing in joining the Club as follows:

> … and they used to say to me, 'why don't you go? They're old enough.' And I said, 'well, they might get on their bike and go for a ride and fall off or something and nobody cares', so I wouldn't go. (Houghton 2010: 7)

In those early days the family was also able to achieve a happy balance in their activities, for example when Dan wanted to go fossicking. Dan would drop Chriss and the boys off at Black Rock, so they could go for a swim while he headed over to Ricketts Point to 'fiddle around the rocks'.

From the start, Chriss was not as interested as Dan in microscopy, yet supported Dan's inter-